**NATURAL RESOURCES CONSERVATION SERVICE**
**Wyoming**
**CONSTRUCTION SPECIFICATIONS**
**FOR**
**IRRIGATION WATER CONVEYANCE**
**CORRUGATED, RIBBED OR PROFILE WALL THERMOPLASTIC PIPE**

_____ (Owner/Operator)

_____ (Project/Title)

GENERAL

Pipelines shall be installed in accordance with a design and plan approved by the responsible technician. Details of construction shown in the design and plan but not included here shall be considered as a part of this specification. Construction activities shall be in accordance with applicable OSHA regulations.

TRENCH CONSTRUCTION

Trench width at any point below the top of the pipe shall be only wide enough to permit the pipe to be easily placed and joined and to allow the initial backfill material to be uniformly placed under the haunches and sides of the pipe. The minimum trench width shall be 24 inches greater than the pipe diameter for mechanical compaction and not less than 18 inches greater than the pipe diameter for water saturated compaction. The maximum trench width shall be no greater than 36 inches wider than the pipe diameter. Trench banks that are more than 5 feet high shall be shored or sloped. Refer to Figure 1 for typical trench details.

Where rock, hardpan, cobbles or other hard material which might prevent the pipe from being uniformly supported is encountered in the bottom of the trench, the trench shall be undercut a minimum of four inches below final grade. The over cut area of the trench will then be filled with sand or fine-grained soil.

BEDDING

The pipe shall be firmly and uniformly bedded throughout its entire length. Bedding material shall be placed and spread in uniform layers and in such a manner as to fill the trench so there are no unfilled spaces below the pipe. For pipe with bell joints, holes shall be dug in the bedding at the bells to permit the body of the pipe to be in contact with the bedding along its entire length. Blocking or mounding shall not be used to bring the pipe up to final grade.

PIPE INSTALLATION

Pipe shall be the diameter, length, material and pressure class as specified on the drawings.

The pipe shall not be dropped into the trench or handled in a manner to cause damage. Individual joints of pipe shall be inspected and any damaged pipe shall be removed and replaced. The pipe will be allowed to come within a few degrees of the temperature it will have after it is completely backfilled before placing fill other than that needed for shading or before connecting the pipe to other facilities.

Hand or mechanical are optional methods for placing and compacting pipe backfill.

Initial Backfill. The initial backfill material shall be either (1) angular 1 to ¼ inch size crush stone with a maximum of 10 percent cohesive fines or (2) sand and gravels (Soil types GW, GP, SW, and SP) with a maximum particle size of 1 inch containing a maximum of 12 percent of noncohesive fines. Sands shall have a maximum of 45 percent passing the # 40 sieve.

The initial backfill materials shall be placed in a manner as not to displace, deform or damage the pipe. The initial backfill materials shall be placed in four to six inch lifts. Each lift shall be shoveled and tamped between the pipe and the edge of the trench wall. Care shall be taken to assure that all voids are filled under the haunch of the pipe.

Final Backfill. The final backfill material shall be soil or sand free of rocks, frozen clods or other debris larger than 1inch in diameter within 6 inches of the pipe and 6 inches in particle size for the remaining portion of the final backfill unless otherwise specified on the drawings. The material shall be placed and spread in approximately uniform layers so there are no unfilled spaces in the backfill. Rolling equipment shall not be used until a minimum of 18 inches of compacted backfill material has been placed over the top of the pipe. Final backfill may be mounded over the top of the trench above ground level, but in no case shall the final backfill be lower than the natural ground along the top of the trench.

All special backfilling requirements of the pipe manufacturer shall be followed.

Cover. The minimum depth for backfill over the top of the pipe shall be 18 inches where there are no hazards. Where there is vehicular traffic, freezing or farming operations the depth of cover shall be a minimum of 30 inches.

At low places on the ground surface or at locations where it is shallow to rock, extra fill may be placed over the pipeline to provide the minimum depth of cover. In such cases, the top width of the fill shall be no less than 10 feet and the side slopes no steeper than 6 horizontal to 1 vertical.

Vertical alignment of pipe shall be uniform and such as to maintain the cover requirements unless otherwise noted on the drawings. If irregular grades are required, thrust blocks, air releases, drains and other appurtenances as needed shall be installed.

Thrust Blocks. Thrust blocks shall be formed against a solid trench wall. They shall be of the minimum size and materials as specified on the drawings.

Joints and Connections. All joints and connections shall be constructed to withstand the design working pressure for the pipeline without leakage and shall leave the inside of the pipeline free of any obstruction which could reduce the pipe capacity below design requirements.

All fittings, such as couplers, reducers, bends, tees and vents shall be made of material that is recommended for use with the type of pipe specified and shall be installed in accordance with the recommendations of the pipe manufacturer. Fittings made of steel or other materials susceptible to corrosion shall (1) be wrapped with plastic tape meeting the requirements of AWWA C 209 for Type I or II tape, or (2) coated with coal-tar epoxy paint (Kippers-Bitumastic No. 300-M is an approved off the shelf product), or (3) painted with one coat of urethane primer applied at a rate of 2 to 3 mils thick and two or more coats of gloss or semi-gloss Alkyd Enamel to provide a minimum thickness of 6 mils or (4) coated with epoxy paint in accordance with the Steel Structures Council (SSPC) Paint Specification # 16.

MATERIALS

Pipe supplied under this specification shall meet the minimum requirements of on of the following:

Corrugated polyethylene pipe and fittings shall conform to ASTM F 667 or AASHTO M294.

Profile wall sewer and drain pipe, polyethylene, shall conform to ASTM F 894.

Ribbed gravity sewer pipe and fittings (PVC), based upon controlled inside diameter shall conform to ASTM F 794 or AASHTO M 304.

All pipe shall be clearly marked to identify the manufacture, pipe size and applicable standard.

TESTING

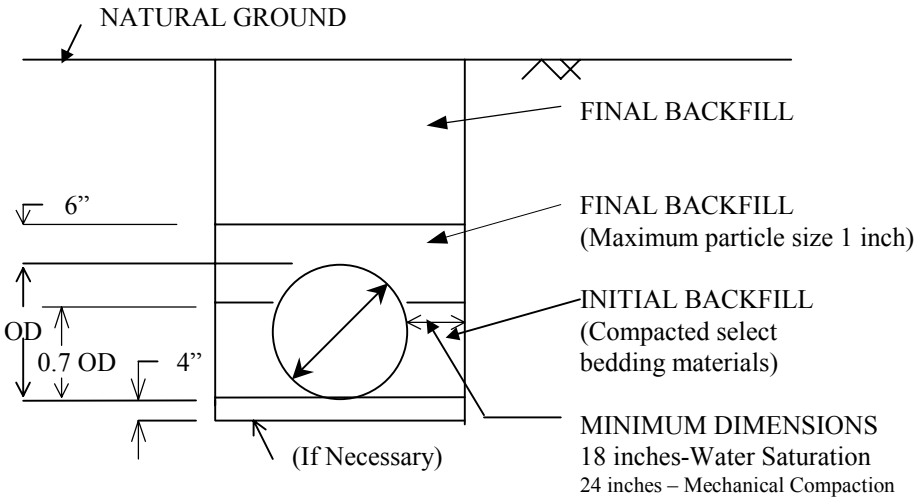
When water is available at the time the pipe is installed the system shall be given an operational test. This test shall consist of filling the pipe with water, taking care to bleed of any air in the pipe. All of the system components shall operate without difficulty. Leakage or defects caused by poor materials or workmanship shall be replaced or repaired. When water is not available to complete a test, the installer shall provide a guarantee stating they will return and fix leaks that are found when the pipe is initially filled with water.

GUARANTEE

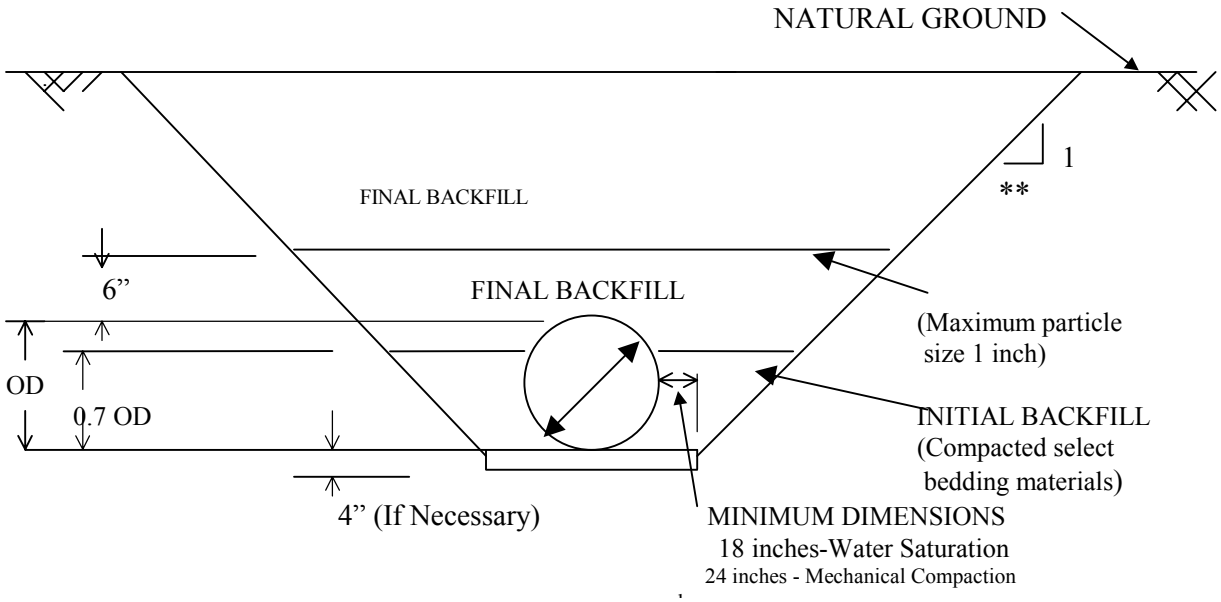
The installing Contractor shall certify that the installation conforms to the requirements of this specification and furnish a written guarantee protecting the landowner against defective materials and workmanship for a period of less not than 1 year. The guarantee will identify manufacturer of pipe and pipe markings.

ADDITIONAL SPECIFICATIONS

FIGURE 1
TRENCH WIDTH AND BACKFILL REQUIREMENTS




TYPICAL TRENCH DETAIL
5 FT DEPTH, MAXIMUM




ALTERNATIVE TRENCH DETAIL
DEPTH GREATER THAN 5 FEET

**Slope typically varies from 3/4 to 1-1/2:1 or greater based upon material classification and other factors such as wetness, vibration, surcharge, etc. Refer to OSHA Subpart P for details.